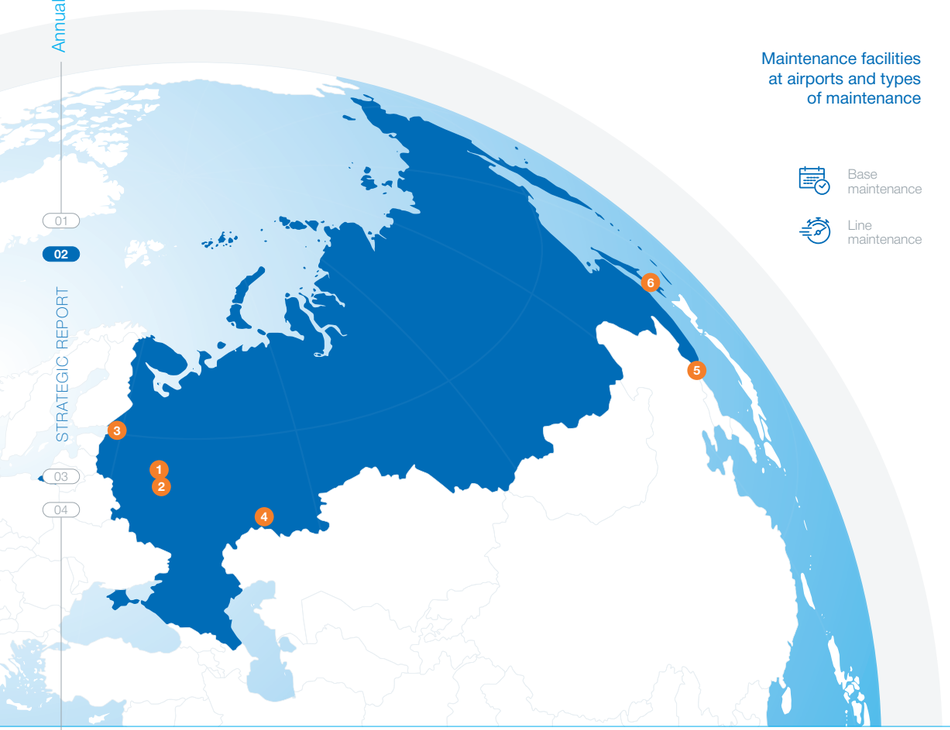
Key innovation development projects in 2019

Construction of a new advanced hangar facility that is completely unique for Russia	Construction of Hangar 4 for aircraft maintenance and repair at Sheremetyevo airport continued in 2019. Hangar 4 is a unique patent-protected facility. It is designed to accommodate one wide-body Boeing 777 or up to three narrow-body aircraft. The hangar will improve the Company's operating performance by reducing aircraft downtime when there is a failure, and for maintenance or engine change. The project will also create new jobs as well as reduce outsourcing by expanding the range of in-house maintenance services for Aeroflot's aircraft.
Digital take-off and landing research. **Development of a software solution to use SSJ100 aircraft take-off and landing data and flight documentation on Electronic Flight Bags**	Expected project outcome is pilots and engineers adopting the software solution to use SSJ100 aircraft take-off and landing data and flight documentation on Electronic Flight Bags.
Research project to study the possibility of building a predictive model of aviation incidents frequency in specific flight conditions	Aeroflot uses an innovative approach exploring new flight safety management options in an environment of growing flight hours, increased cockpit crew workload and evolving flight conditions. The project studied the possibility of building a predictive model of aviation incidents frequency in specific flight conditions. Modelling was based on aircraft specifications and performance, flight crew performance, aerodrome network characteristics, flight hour projections and external factors. The result is a reliable model predicting aviation incidents frequency, built on the information from the database. The study helps identify the limitations of the existing database and formulate recommendations for further development of the Company's information systems and databases.
Digitalisation projects	✈ Development of a software solution to prepare consolidated targets of Aeroflot Group's Innovative Development Programme and improvement of the automated monitoring system ✈ Development of an Executive Dashboard software solution at PJSC Aeroflot ✈ Continuous delivery for website updates ✈ Cargo agent's personal account ✈ Upgrade of document scanning features of the government-sponsored flights booking system ✈ Cargo Air, an automated system for predicting cargo and mail capacities ✈ E-ticket and boarding pass import into the Google Pay app ✈ Further development of the automated ETA module ✈ Occupational Safety system, and others

Aircraft Maintenance and Repair

Aeroflot Group has an efficient aircraft maintenance, repair, and overhaul (MRO) system aimed at ensuring high fleet reliability, flight safety and on-time performance.

The MRO policy of Aeroflot Group airlines provides for strict compliance with the requirements of countries of registration, maintenance programmes and aircraft lease agreements. It is focused on enhancing capacity and technical competencies, rolling out cutting-edge technological solutions and providing employee training and development opportunities while improving economic efficiency.



Maintenance facilities at airports and types of maintenance

Base maintenance

Line maintenance

1
Moscow
Sheremetyevo airport

Aeroflot, A-Technics

2 **Wide-body hangars**

1 **Narrow-body hangar**

5 types of aircraft

- Airbus A320F
- Airbus A330
- Boeing 777
- Boeing 737-800NG
- SSJ100

2
Moscow
Vnukovo airport

A-Technics

1 **Wide-body hangar**

4 types of aircraft

- Airbus A320F
- Boeing 737
- Boeing 747
- Boeing 777

3
Saint Petersburg
Pulkovo airport

Rossiya

2 **Narrow-body hangars**

4 types of aircraft

- Airbus A320F
- Boeing 737
- Boeing 747
- Boeing 777

4
Orenburg
Orenburg airport

A-Technics

1 **Narrow-body hangar**

1 type of aircraft

- Boeing 737

5
Vladivostok
Vladivostok airport

Aurora

3 types of aircraft

- Airbus A319
- DHC-6-400
- DHC-8-200/300/400

6
Yuzhno-Sakhalinsk
Yuzhno-Sakhalinsk airport

Aurora

3 types of aircraft

- Airbus A319
- DHC-6-400
- DHC-8-200/300/400 *

* Not including C-check.

7 hangars
to maintain and repair aircraft

Each of the Group companies has departments responsible for airworthiness and maintenance of operated aircraft. Aeroflot Group has in place a strategic programme to centralise maintenance of aircraft and components for Aeroflot and subsidiary airlines. The centralisation provides for separating base and line maintenance.

PJSC Aeroflot's Aircraft Maintenance Department holds and maintains certificates issued by European, Bermudian, and Russian aviation authorities for maintenance of the following types of aircraft and components:

- Airbus A320F (Line maintenance, A-check, C-check, 6YE-check);
- Boeing 737 (Line maintenance, Base maintenance);
- Airbus A330 (Line maintenance, A-check, C-check);
- Boeing 777 (Line maintenance);
- SSJ 100 (Line maintenance, Base maintenance);
- Airbus A350 (Line maintenance).

Scheduled maintenance of all types of operated aircraft is performed under programmes developed in line with the guidelines provided by aircraft and key components manufacturers. Maintenance of key aircraft components, such as engines, landing gear, and auxiliary power unit (APU) is performed by third-party contractors.

The Company serviced 145.3 thousand takeoffs at Sheremetyevo (base airport) in 2019, up 9.3% year-on-year. Labour intensity per flight hour of Aeroflot fleet aircraft was 2.00 hours in 2019 (vs 2.27 in 2018).

In addition to own fleet maintenance, the Company offers maintenance services to third-party customers. Technical support services were provided to 31 airlines (including foreign ones) and 42 aircraft operators and MRO companies in 2019. During 2019, around 40% of Aeroflot airline's fleet heavy maintenance operations were performed by in-house maintenance facilities and 61% were carried out by contractors.

MRO divisions at PJSC Aeroflot

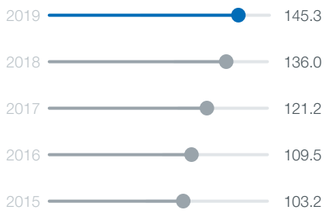
Aircraft Maintenance Department	Maintains aircraft operated by Aeroflot and other Group airlines
Airworthiness Department	Maintains airworthiness of aircraft operated by Aeroflot, manages technical condition of the fleet throughout the entire aircraft life cycle, develops and implements PJSC Aeroflot's strategy and policy covering aircraft operation
Quality Assurance Department	Develops a quality management system for aircraft maintenance and airworthiness

Frequency of aircraft inspections

Type of maintenance	Frequency and aircraft type	Description
Transit Check	✈ After each landing at the base airport for Airbus A320/321, Boeing 737, SSJ100 ✈ After each landing for Boeing 777, Airbus A330	General inspection of the aircraft, cabin inspection, engine oil top-up
Oil Check	✈ 24 hours for Airbus A320/321	Engine oil top-up
Daily Check	✈ 48 hours for Boeing 737, 777, SSJ100	Inspection of wheels, brakes, fluid and gas refill
3 DY Check	✈ 72 hours for Airbus A320/321, 330	Inspection of wheels, brakes, fluid and gas refill
Weekly Check	✈ 7 days for SSJ100	Inspection of the cargo compartment and cabin equipment and furnishings
10 DY Check	✈ 10 days for Airbus A320/321, 330, Boeing 777	Inspection of the cargo compartment and cabin equipment and furnishings
Service Check	✈ 500 flight hours for Boeing 737	Inspection of the cargo compartment and cabin equipment and furnishings, generator oil top-up
375FH Check	✈ 375 flight hours for SSJ100	Landing gear lubrication
A Check	✈ 750 flight hours for Airbus A320/321, SSJ100 ✈ 800 flight hours for Airbus A330 ✈ 1,000 flight hours for Boeing 737, 777	Inspection of key zones of the aircraft, systems functional check, lubrication of landing gear and flight control systems
C Check	✈ 7,500 flight hours for Airbus A320/321, SSJ100, Boeing 737 ✈ 18 months for Airbus A330 ✈ 3 years for Boeing 777	Detailed visual inspection with inspection panels open, systems operational check
D Check	✈ 6 and 12 years for Airbus A320/321, 330, Boeing 737 ✈ 8 and 12 years for Boeing 777, SSJ100	Detailed visual inspection of structural elements for corrosion and fatigue, involves deep aircraft teardown

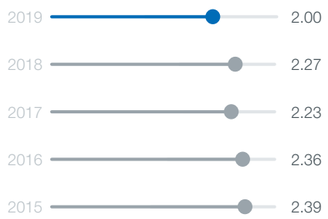
Take-offs serviced at Sheremetyevo airport

145.3 thousand



Labour intensity per flight hour of Aeroflot airline aircraft

2.00 man-hours



A-Technics

A-Technics is a Group subsidiary that specialises in maintenance and repair of aircraft and components. The company has maintenance centres in Moscow's Sheremetyevo and Vnukovo and in Orenburg airport.

A-Technics enjoys successful and steady growth. Base maintenance of Aeroflot airline's SSJ100 fleet was organised at Sheremetyevo airport in 2019. Six regional line maintenance stations have been set up in six cities (Belgorod, Voronezh, Nizhny Novgorod, Saratov, Stavropol, Ulyanovsk). A-Technics was rated to carry out base maintenance of Airbus A321 aircraft at Sheremetyevo airport.

A line maintenance station for SSJ100 and Boeing 737 aircraft has been set up at Krasnoyarsk.

In 2019, A-Technics serviced 35 Rossiya's aircraft, 91 Aeroflot's aircraft and 10 Pobeda's aircraft, as well as other airlines' aircraft.

A-Technics won the **Achievement of the Year** in Russian MRO Market award at the MRO Russia and CIS event.